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| 10/575,744 | 04/10/2006 | Barry Hudson | CALL.P0104WOU'S | 2558 |
| 7590 Renner Otto Boisselle & Sklar 1621 Euclid Avenue-Nineteenth Floor Cleveland, OH 44115 | | | EXAMINER DUFF, DOUGLAS J | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/575,744

Applicant(s)

HUDSON, BARRY

Examiner

DOUGLAS J. DUFF

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4 and 6-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4 and 6-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

This Office Action is in response to Applicant's amendments filed 8/11/08.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Lundstrom et al. (US 377723). Regarding claim 1, Lundstrom discloses a rotary engine comprising a housing having a male rotor (54) having a plurality of projecting lobes and a female rotor (56) having a plurality of cavities, the male and female rotors being mounted for synchronous rotation about parallel axes such that during rotation successive lobes on the male rotor mate with successive cavities (74) on the female rotor to define therewith a combustion chamber in which a mixture of air and fuel is compressed by the interaction of the lobe and the cavity during rotor rotation (Figs. 4 and 5); at least one exhaust port (51) leading out of the housing for discharge of exhaust gases from the cavity of the female rotor following combustion and from an inter-lobe space between adjacent lobes of the male rotor following combustion; and respective purge ports (42, 46) leading out of the housing downstream of the exhaust port in the direction of rotor rotation to facilitate discharge of residual exhaust gases from the cavity and inter-lobe space (middle port of 42, 46, Fig. 5), the purge ports leading radially out of the housing to facilitate the discharge of the residual exhaust

gases under the effect of centrifugal force generated by rotor rotation, the purge ports being associated with air inlet ports (top and bottom ports of 42, 46, Fig. 5) located in at least one of two end walls of the rotor housing (left and right sides of Figs. 4, 5) and partially overlap the purge ports (Fig. 5) to admit air into the cavity and inter-lobe space in preparation for the subsequent combustion cycle (Figs. 4, 5).

3. Regarding claims 2-6, Lundstrom discloses the rotary engine as claimed in claim 1 comprising a separate exhaust port (49, 51) for the male and female rotor, the purge ports (42, 46) lead radially out of the housing to facilitate the discharge of the residual exhaust gases under the effect of centrifugal force generated by rotor rotation, the purge ports extend over a relatively large arc of the order of 90° to 120° (90 degrees, Fig. 4), the intake ports (Fig. 5) are located in at least one of two end walls (left, right side wall of housing, Fig. 5) of the rotor housing and the intake ports are located in both end walls of the rotor housing (Fig. 5).

4. Claims 36 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Habsburg-Lothringen (US 4003349). Habsburg-Lothringen discloses a rotary engine comprising at least one rotor (13) enclosed in a housing, the rotor having at least one tip that contacts a portion of the housing during rotation, the tip ceasing to contact the housing in the region of a combustion chamber as the rotor the tip passes the combustion chamber during rotation of the rotor (col. 2, lines 21-30); wherein a landing zone (24) is provided in the housing to provide for the gradual re-engagement between the tip and said portion of the housing after the tip passes the combustion chamber and the landing zone is in the form of a curved ramp (24, Fig. 2).

5. Claims 43-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Nilsson (US 3664778). Regarding claim 43, Nilsson discloses a rotary engine comprising at least one rotor (50); a first seal (152, left side of Fig. 9) provided in a first channel (in 150) in the rotor (50); a second seal (152, right side) provided in a second channel of the rotor (150, Fig. 9), an end of the first channel meeting an end of the second channel (atop Fig. 9); and a blocking element (166) that is provided in the region where the end of the first channel meets the end of second channel for preventing exhaust gases generated during a combustion cycle of the rotary engine from entering said channels between the seals and the rotor (Figs. 9-15).

6. Regarding claims 44-47, Nilsson discloses the rotary engine as claimed in claim 43, further comprising a blocking biasing element (166) for biasing the blocking element towards the housing away from the rotor (50), the blocking biasing element is a coil spring (172), the blocking element is substantially a cylindrical shaped stopper (166) and the blocking element is substantially a piston (166, Figs. 10, 11).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7, 13, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundstrom in view of Habsburg-Lothringen. Regarding claim 7, the modified Lundstrom device discloses the elements as discussed in the rejection of

claims 1 and 36 above including Habsburg-Lothringen disclosing a male tip seal for sealing between the housing and a lobe, the seal being on the lobe and running along the length of the rotor (col. 2, lines 21-30). It would have been obvious for a person having ordinary skill in the art at the time the invention was made to utilize a landing zone in the housing following the combustion chamber in order to allow the seals of each rotor lobe to gradually contact the housing which prevents damage to the seals and reduces noise from the impact of the lobe onto the housing.

9. Regarding claims 13, 14 and 20, the modified Lundstrom device discloses the device of claim 7 including a second landing zone (other side of 24) following the combustion chamber where during rotation of the rotors, the female tip seal ceases to contact the housing in the region of the combustion chamber (v4, Fig. 2), providing gradual re-engagement between the seal and the housing after the seal passes the combustion chamber (Figs. 1-10), the landing zones being in the form of a curved ramp (Fig. 1).

10. Claims 8-11, 15-18, 21-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Lundstrom in view of Habsburg-Lothringen as applied to claims 7 and 14 above, and further in view of Nilsson. The modified Lundstrom device discloses the invention of claims 7 and 14, but fails to disclose details of the tip seal including an element for biasing the male and female tip seal in a substantially radial direction away from the male and female rotor, the element for biasing being a leaf spring, the male and female tip seal mounted in a channel in the lobe, the male and female tip seal having a shoulder portion that interacts with an undercut portion in the channel to limit

the movement of the male and female tip seal in a radial direction and the blocking element, blocking biasing element and coil spring.

11. Nilsson teaches a rotary engine with an element for biasing the male and female tip seal in a substantially radial direction away from the male and female rotor, the element for biasing being a leaf spring, the male and female tip seal mounted in a channel in the lobe, the male and female tip seal having a shoulder portion that interacts with an undercut portion in the channel to limit the movement of the male and female tip seal in a radial direction and the blocking element, blocking biasing element and coil spring as described in the rejection of claims 43-47 above. It would have been obvious for a person having ordinary skill in the art at the time the invention was made to utilize tip seals as described above in order to reduce the leakage within the engine to increase the efficiency of the engine (col. 2, lines 1-9).

12. Claims 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundstrom in view of Nilsson. Lundstrom discloses the engine of claim 1, but fails to disclose a first seal provided in a first channel of a rotor; a second seal provided in a second channel of the rotor, an end of the first channel meeting an end of the second channel; and a blocking element that is provided in the region where the end of the first channel meets the end of second channel for preventing exhaust gases generated during a combustion cycle of the rotary engine from entering said channels between the seals and the rotor, a blocking biasing element for biasing the blocking element towards the housing away from the rotor, the blocking biasing element is a coil spring, the

blocking element is substantially a cylindrical shaped stopper and the blocking element is substantially a piston.

13. Nilsson teaches an engine with a first seal (152, left side of Fig. 9) provided in a first channel (in 150) in the rotor (50); a second seal (152, right side) provided in a second channel of the rotor (150, Fig. 9), an end of the first channel meeting an end of the second channel (atop Fig. 9); and a blocking element (166) that is provided in the region where the end of the first channel meets the end of second channel for preventing exhaust gases generated during a combustion cycle of the rotary engine from entering said channels between the seals and the rotor (Figs. 9-15), a blocking biasing element (166) for biasing the blocking element towards the housing away from the rotor (50), the blocking biasing element is a coil spring (172), the blocking element is substantially a cylindrical shaped stopper (166) and the blocking element is substantially a piston (166, Figs. 10, 11). It would have been obvious for a person having ordinary skill in the art at the time the invention was made to utilize tip seals as described above in order to reduce the leakage within the engine to increase the efficiency of the engine (col. 2, lines 1-9).

14. Claims 37-40 rejected under 35 U.S.C. 103(a) as being unpatentable over Habsburg-Lothringen in view of Nilsson. Habsburg-Lothringen discloses the engine of claim 36, but fails to disclose the Nilsson elements as described in the rejections above.

15. Nilsson teaches the engine as described in the rejections above. It would have been obvious for a person having ordinary skill in the art at the time the invention was

made to utilize tip seals as described above in order to reduce the leakage within the engine to increase the efficiency of the engine (col. 2, lines 1-9).

16. Claims 12, 19 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Lundstrom device. The modified Lundstrom device discloses the engine of claims 7, 14 and 36, but does not specify an exact length of the landing zone.

17. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to mill the housing for a landing zone length of 4 mm because Applicant has not disclosed that a length of 4 mm provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Lundstrom's rotary engine, and Applicant's invention, to perform equally well with either the landing zone length taught by Lundstrom or the claimed 4 mm length because both landing zone lengths would perform the same function of providing a curved ramp for the seal to gradually contact the housing in order to prevent wear on the seal or excessive operating noise.

Therefore, it would have been prima facie obvious to modify Lundstrom to obtain the invention as specified in claims 12, 19 and 41 because such a modification would have been considered a mere design consideration which fails to patentably distinguish over the prior art of Lundstrom. See also MPEP 2144.04, subsection IV. A. – change in size or proportion.

Response to Arguments

18. Applicant's arguments filed 8/11/08 have been fully considered but they are not persuasive. Regarding the argument directed towards Lundstrom, the Examiner respectfully disagrees. While the Applicant attempts to claim "the effect of causing fresh air to be centrifuged diametrically outwards into the purge ports causing a clean cool flow of air through the male and female cavities prior to injection and compression phases", the claim language still reads on the Lundstrom reference including "the purge ports leading radially out of the housing to facilitate the discharge of residual exhaust gases under the effect of centrifugal force" (Col. 7, lines 46-53). Additionally, although Lundstrom's purge ports are separated by axial walls, they are overlapping as shown in Fig. 4 and as claimed by the Applicant.

19. Regarding the argument directed towards the Habsburg-Lothringen reference, the Examiner respectfully disagrees. Item 24 in Figure 1 shows a landing zone to provide for the gradual re-engagement between the rotor tip and the housing. In fact, Habsburg-Lothringen clearly shows these landing zones on the upper and lower re-engagement areas, so the direction of operation would be irrelevant since the gradual re-engagement would occur downstream of the combustion chamber in either direction.

20. Regarding the argument directed towards Nilsson, the Examiner respectfully disagrees. Specifically, the Applicant argues that the blocking element 166 of Nilsson is not provided in the region where the two channels meet. The Examiner would like to point out that the channels are substantially continuous and that, while there are two blocking elements 166 shown in Figure 9, the first channel along 150 from the left side

of Fig. 9 to the right side blocking element 166, where it meets the second channel 150 running down the right side of Fig. 9. These perform the claimed function of "preventing exhaust gases generated from entering both channels between the seals and the rotor".

Conclusion

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **DOUGLAS J. DUFF** whose telephone number is (571)272-3459. The examiner can normally be reached on M-Th 7 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas E. Denion/
Supervisory Patent Examiner, Art Unit 3748

/Douglas J Duff/
Examiner, Art Unit 3748
11/10/08